quality and handling of micropropagated saplings before and during planting are important in the production of an efficient root system. Planting micropropagated saplings at a higher density than macropropagated trees might also improve anchorage by facilitating root ground cover.

doi:10.1016/j.sajb.2007.02.170

Regulation of photosynthetic activity by sucrose and hexose in leaves of sugarcane

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In crops other than sugarcane there is good evidence that the size and activity of carbon sinks influence source photosynthetic activity via regulation of photosynthesis-related enzymes, an effect that is partly mediated through coarse regulation of gene expression. The existence in sugarcane of a robust sugar-dependent relationship between leaf and sink tissues could represent a potentially fundamental limiting factor for sucrose accumulation in the stalk and consequently play a major role in overall sucrose yield. Previous work in our laboratories has demonstrated that increased culm sink demand through partial shading resulted in increased photosynthetic rates that correlated with a reduction in hexose levels in the leaves. In an extension of that study, we have examined source regulation in detached leaves (third fully-expanded) of pot grown *Saccharum* spp. hybrid cv. N19 (N19) with the aim of elucidating the mechanisms that determine carbon partitioning in sugarcane. Excised leaves preincubated in darkness for 3 h had increased photosynthetic rates on transfer back to light, relative to control plants maintained in the light. Tissue sucrose accumulation was reduced by darkness, but accumulated again upon transfer to the light. However, after the dark period, hexose levels remained significantly lower for the remainder of the incubation time; possibly indicating that photosynthesis was up-regulated by lack of hexose accumulation. When the excised leaves were fed a 1 mM sucrose solution via the transpiration stream, dark-treated leaves exhibited reduced photosynthetic rates, which were associated with increased sucrose and hexose concentrations within the leaf tissue. This down-regulation of photosynthesis by sugar accumulation was further explored by supplying the leaf transpiration stream with a variety of metabolites that have putative roles in mediating the source–sink relationship.

doi:10.1016/j.sajb.2007.02.171

Antimicrobial activity of medicinal plants against oral microorganisms

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Ethanol extracts of nine plant species used traditionally in the treatment of oral diseases were screened *in vitro* for antimicrobial activity against oral pathogens namely *Actinobacillus actinomycetemcomitans*, *Actinomyces naeslundii*, *Actinomyces israelii*, *Candida albicans*, *Porphyromonus gingivalis*, *Privotella intermedi* and *Streptococcus mutans.* The antimicrobial activity was determined using the agar disk diffusion method. Out of nine plants, six showed good antimicrobial activity. The extract of the leaves of *Euclea natalensis* inhibited the growth of *C. albicans* at a concentration of 20 μg/μl and none of the extracts inhibited *A. actinomycetomcomitans*. The minimum inhibitory concentration, minimum bactericidal concentration and cytotoxicity were also determined. A pure triterpenoid was isolated from *E. natalensis* and we will report on its antimicrobial activity.

doi:10.1016/j.sajb.2007.02.172

Mutagenic and antimutagenic effects of *Sutherlandia frutescens*

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Sutherlandia frutescens is a popular herbal product in South Africa which has reputed anti-cancer and anti-HIV properties. In spite of its widespread usage there is very little scientific evidence on its efficacy and potential toxicity. Dried ground whole plant material of *S. frutescens* was extracted by both sequential and non-sequential extractions using water and various organic solvents. The ethylacetate and 50% aqueous methanolic extracts were screened for mutagenic and antimutagenic activity using the *Salmonella*/microsome mutagenicity assay (double layer Ames test) against *Salmonella typhimurium* TA97a, TA98, TA100 and TA102 bacterial strains in the presence and absence of metabolic activation S9. The ethylacetate extract indicated antimutagenicity against all the bacterial strains tested. The 50% aqueous methanolic extract showed both antimutagenic and promutagenic activities. This is the first